

Notice of Allowability

Application No.

10/728,517

Examiner

Toniae M. Thomas

Applicant(s)

KIM ET AL.

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on 27 December 2006.
2. ☒ The allowed claim(s) is/are 1-6, 11-34 and 40.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 03/14/07
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

M. Wilczewski
Primary Examiner

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 14 March 2007 has been considered. While the IDS has been considered note that the US patent citation, US 5,665,646, has been lined through, since the patent was previously cited by the examiner and relied upon in the Office action mailed on 27 September 2006 (see the Office action mailed on 27 September 2006 and the PTO-892 Form attached thereto).

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: Applicant's arguments filed on 27 December 2006 with respect to the rejection of claims 11-13, 16, 18, and 19 under 35 USC §103(a) as being unpatentable over Kitano (US 5,665,646) in view of Stols (US 6,200,942 B1) are persuasive. Specifically, the argument that "one [having] ordinary skill in the art would not look to Stols to remove both the titanium film and TiN layer while not removing the TiSi_2 layer in manufacturing a CMOS semiconductor device" (see Remarks - page 9, lines 5-7). Accordingly, the rejection is withdrawn.

3. The prior art of record fails to anticipate, teach or suggest, either separately or combined: a method of selectively removing metal layers using a cleaning solution, which comprises an acid solution, water, and an iodine-containing oxidation agent selected from the group consisting of NH_4IO_3 , LiIO_3 , CaIO_3 , BaIO_3 , KI, and NH_4I , as recited in claim 1; a method of selectively removing a metal layer in a process for forming a silicide layer,

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wherein the method comprises cleaning a non-reacting metal layer that does not participate in the silicidation reaction using a cleaning solution that includes an acid solution and an oxidation agent containing iodine, as recited in claim 11; or a method of selectively removing a metal layer in a process for forming a silicide layer, wherein the method comprises performing a cleaning that removes both a titanium nitride layer and a non-reacting metal layer using a cleaning solution comprising an acid solution, an iodine-containing oxidation agent, and water, as recited in claim 25.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

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Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TMT

17 March 2007



M. Wilczewski
Primary Examiner
TC 2800